1. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form $ax^3 + bx^2 + cx + d$.

$$\frac{5}{2}, \frac{-1}{2}, \text{ and } -7$$

A. $a \in [2, 10], b \in [36.1, 42.5], c \in [86, 95],$ and $d \in [30, 40]$

B. $a \in [2, 10], b \in [18.8, 21.8], c \in [-65, -58],$ and $d \in [-35, -32]$

C. $a \in [2, 10], b \in [35.9, 37.2], c \in [42, 60],$ and $d \in [-35, -32]$

D. $a \in [2, 10], b \in [-22.7, -19.9], c \in [-65, -58],$ and $d \in [30, 40]$

E. $a \in [2, 10], b \in [18.8, 21.8], c \in [-65, -58],$ and $d \in [30, 40]$

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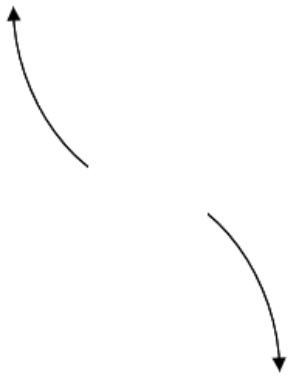
2. Describe the end behavior of the polynomial below.

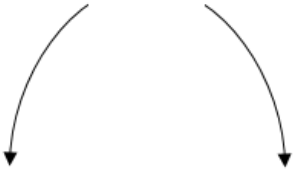
$$f(x) = -6(x-6)^3(x+6)^6(x+2)^3(x-2)^3$$

A.

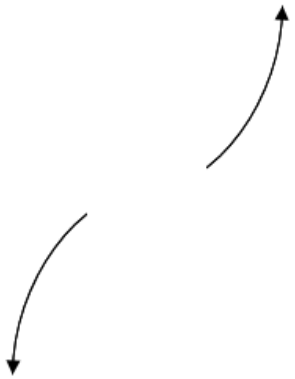


C.

B.



D.



E. None of the above.

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3. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form $x^3 + bx^2 + cx + d$.

$$4 - 3i \text{ and } 2$$

A. $b \in [-15, -8], c \in [35, 44],$ and $d \in [-50, -44]$

B. $b \in [-5, 4], c \in [1, 7],$ and $d \in [-8, 2]$

C. $b \in [10, 15], c \in [35, 44],$ and $d \in [50, 56]$

D. $b \in [-5, 4], c \in [-9, 0],$ and $d \in [6, 11]$

E. None of the above.

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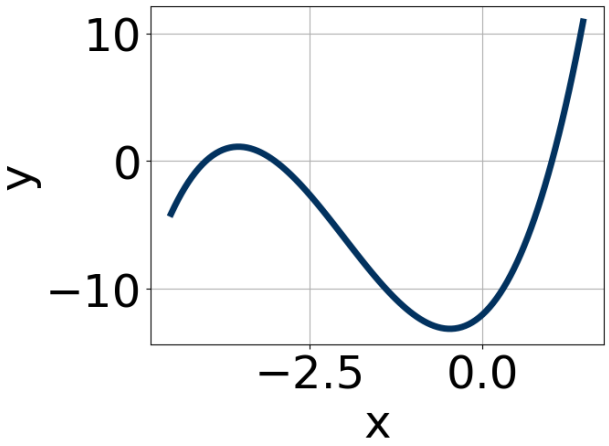
4. Which of the following equations *could* be of the graph presented below?



A. $15(x-1)^4(x+3)^4(x+4)^9$

B. $-12(x-1)^{10}(x+3)^{11}(x+4)^{11}$

C. $-11(x-1)^{11}(x+3)^7(x+4)^7$

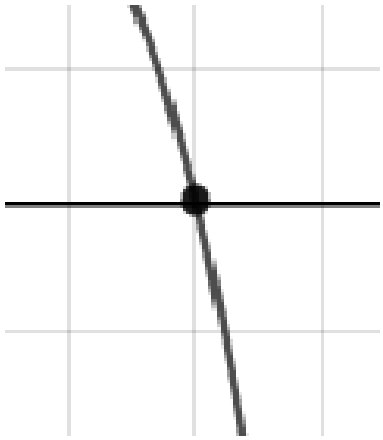
D. $3(x-1)^7(x+3)^9(x+4)^9$

E. $20(x-1)^8(x+3)^5(x+4)^9$

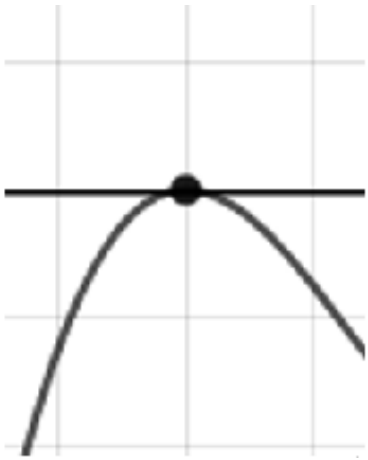
---

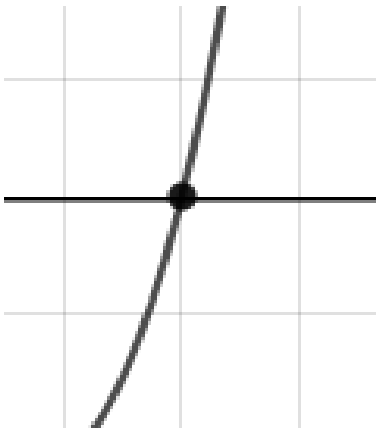
5. Describe the zero behavior of the zero $x = 4$ of the polynomial below.

$$f(x) = -6(x-4)^2(x+4)^3(x-8)^2(x+8)^5$$

A. 

C. 

B. 

D. 

E. None of the above.

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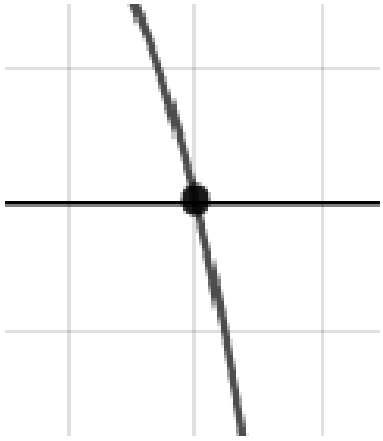
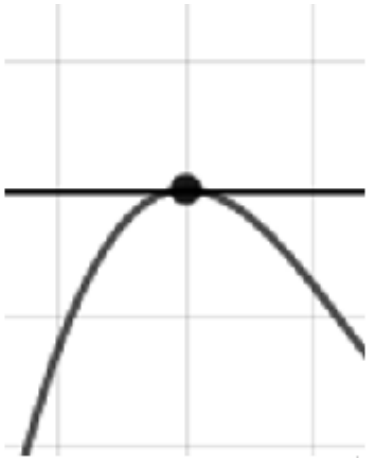
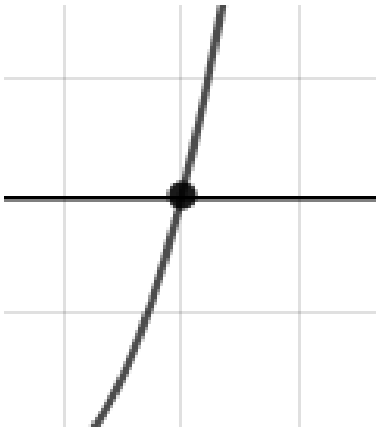
6. Describe the zero behavior of the zero $x = 5$ of the polynomial below.

$$f(x) = -5(x+5)^3(x-5)^4(x+7)^2(x-7)^4$$

A. 

B. 

C. 

D. 

E. None of the above.

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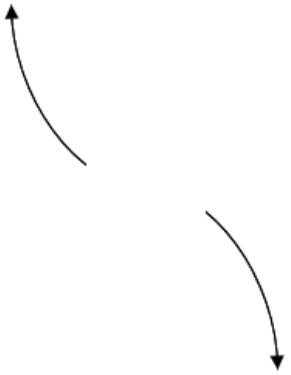
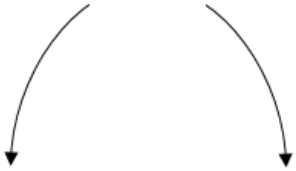
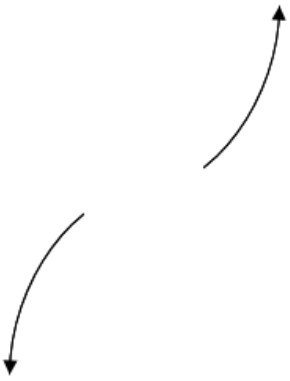
7. Describe the end behavior of the polynomial below.

$$f(x) = 6(x-6)^4(x+6)^7(x-5)^3(x+5)^4$$

A. 

C. 

B. 

D. 

E. None of the above.

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8. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form $x^3 + bx^2 + cx + d$.

$$-3 - 4i \text{ and } 1$$

A. $b \in [-2.7, 4.7], c \in [0.81, 2.83],$ and $d \in [-3.5, -2.56]$

B. $b \in [-7.9, -3.5], c \in [17.28, 19.46],$ and $d \in [24.68, 25.62]$

C. $b \in [-2.7, 4.7], c \in [2.24, 5.06],$ and $d \in [-4.56, -3.05]$

D. $b \in [3.6, 7.4], c \in [17.28, 19.46],$ and $d \in [-25.02, -24.7]$

E. None of the above.

---

9. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form $ax^3 + bx^2 + cx + d$.

$$\frac{-2}{3}, \frac{1}{3}, \text{ and } \frac{5}{4}$$

A. $a \in [35, 37], b \in [-38, -31], c \in [-31, -22],$ and $d \in [-13, -7]$

B. $a \in [35, 37], b \in [-38, -31], c \in [-31, -22],$ and $d \in [8, 17]$

C. $a \in [35, 37], b \in [-60, -55], c \in [4, 16],$ and $d \in [8, 17]$

D. $a \in [35, 37], b \in [-86, -76], c \in [53, 57],$ and $d \in [-13, -7]$

E. $a \in [35, 37], b \in [32, 39], c \in [-31, -22],$ and $d \in [-13, -7]$

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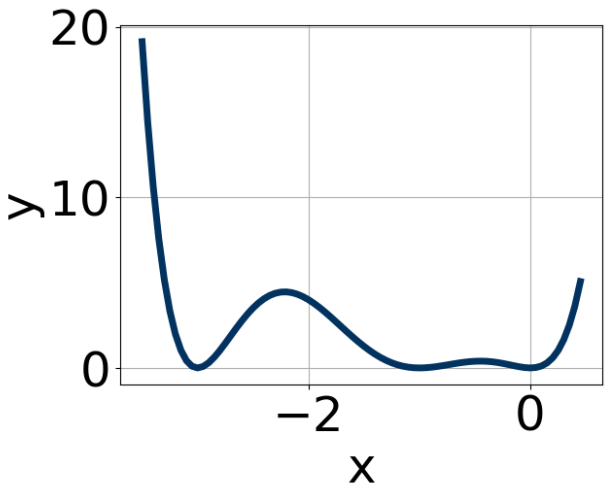
10. Which of the following equations *could* be of the graph presented below?



A. $4x^{10}(x+3)^{10}(x+1)^{6}$

B. $10x^{8}(x+3)^{8}(x+1)^{11}$

C. $6x^{5}(x+3)^{4}(x+1)^{9}$

D. $-15x^{10}(x+3)^{4}(x+1)^{10}$

E. $-6x^{6}(x+3)^{8}(x+1)^{5}$
